

AP Statistics Worksheet
Simulations and Samples

Name: _____

1. A basketball player makes 47% of her shots from the field during the season. To simulate whether a shot is made or is missed you would assign random digits as follows:
 - a. 4 and 7: shot is made
0, 1, 2, 3, 6, 8, 9: shot is missed
 - b. Odd digits: shot is made
Even digits: shot is missed
 - c. 00—47: shot is made
48—99: shot is missed
 - d. 00—46 shot is made
47—99: shot is missed
 - e. 00—45: shot is made
46-99: shot is missed

2. Using the question and answer from #1, use these random digits to simulate 10 shots:
82734 71490 20467 47511 81676 55300 94383 14893
How many of these shots were made?
 - a. 2
 - b. 3
 - c. 4
 - d. 5
 - e. 6

3. For a large table of random numbers, which of the following is NOT a correct statement:
 - a. The table will contain, somewhere, the sequence of digits 1234.
 - b. Consecutive rows do not start with the same digits.
 - c. Each digit 0 through 9 occurs with equal frequency.
 - d. Each three-digit number 000 through 999 occurs with equal frequency
 - e. The contents of one section of the table are independent of other sections of the table.

4. Sampling error (variability) occurs:
 - a. When interviewers make mistakes resulting in bias
 - b. Because a sample statistic is used to estimate a population parameter
 - c. When interviewers use judgement instead of random choice in picking the sample.
 - d. When samples are too small
 - e. In all the above cases.

5. A researcher wants to determine the reading level of seniors in the state of Pennsylvania. The researcher obtains a list of all the high schools in the state (public, private, and on-line) and randomly chooses 100 of those high schools. She then administers a reading test to all those students in those 100 high schools. The researcher used a
 - a. Simple random sample
 - b. Systematic sample
 - c. Cluster sample
 - d. Stratified sample
 - e. None of the above

6. In a survey, it is important to use randomization because
- It eliminate sampling error
 - It will assure that we have a sample that is in the exact same proportion as the population
 - It will minimize bias
 - It will create a sample size that is correct for the survey
 - All the above
7. A teacher wants to look back over a test that she has given every year for the past 10 years and determine if students incorrectly answered a certain question. She has over 300 tests and wants to have a sample of about 40 tests. She randomly puts the tests in a pile (there is no other order in the stack of tests). She then uses a random number table and determines that she will start her sample with the 4th test. She then uses the random number table and determines that she will also add to her sample ever 12th test. So, the next test she will add to the sample will be the 16th test; and then the 28th, and so on. The teacher has used
- Simple random sample
 - Systematic sample
 - Cluster sample
 - Stratified sample
 - None of the above
8. A student run newspaper runs a weekly question that readers can answer online or by campus mail. One question was "Do you feel the university is doing enough to keep the high cost of a undergraduate education down, given the severity of the recent economic crisis?" This question:
- Is biased due to undercoverage
 - Is biased due to response error
 - Is not biased due to the fact that all students had an equal chance to be part of the survey
- I only
 - II only
 - III only
 - I and II
 - I, II and III
9. You want to determine the views of Souderton High School students concerning a new law that was passed requiring you, when you turn 18, to spend a year in the military. You do not have the time to survey all students so you decide to conduct a stratified sample because you believe that the views of the students may differ based on their age (grade in school). Describe how you would conduct that survey.

10. Suppose a large university is trying to determine if they should institute a new policy about alcohol use on campus. They decide that they will conduct a cluster sample and will use the different departments on campus as clusters. Below is a list of the departments. Describe how you would determine which departments to include in your survey (pick 6) and then describe how you would obtain the sample from within each cluster (the departments are too large and the cost too high to conduct a census within each department.). Use the random number table below to pick the departments in your survey.

19223	95034	05756	28713	96409	12531	42544	82853
73676	47150	99400	01927	27754	42648	82425	36290
45467	71709	77558	00095	32863	29485	82226	90056
52711	38889	93074	60227	40011	85848	48767	52573
95592	94007	69971	91481	60779	53791	17297	59335
68417	35013	15529	72765	85089	57067	50211	47487
82739	57890	20807	47511	81676	55300	94383	14893
60940	72024	17868	24943	61790	90656	87964	18883
36009	19365	15412	39638	85453	46816	83485	41979
38448	48789	18338	24697	39364	42006	76688	08708

English	Art	Education	Political Science	Computer Science
Accounting	Music	Chem. Engineering	Foreign Language	Anthropology
Mathematics	Chemistry	Mechanical Engineering	Marketing	Theater
Psychology	Physics	Civil Engineering	Finance	Theology
Sociology	Biology	History	Economics	Zoology

11. Do you see any potential problems with this sampling method? Explain.